MITSUBISHI ELECTRIC
Changes for the Better

Automating the World

FACTORY AUTOMATION

Customer Reference

25 Years of Reliable Automation: Mitsubishi Electric MELFA Robot Powers Sustainable Production at Durable

How a quarter-century of continuous robotic operation demonstrates the value of quality-conscious automation investment

Key points

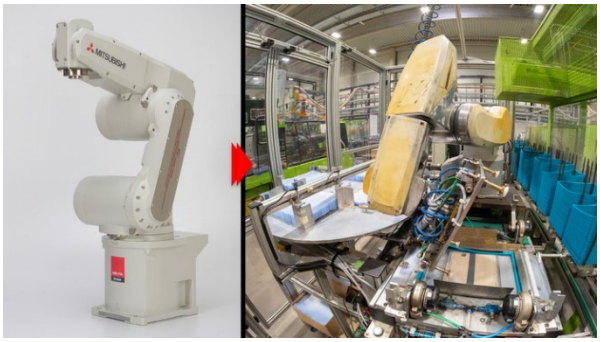
- **Exceptional longevity:** 25 years of continuous operation demonstrates robust, reliable technology
- **Compact design:** Robot fits within tight production cell whilst performing all required movements
- **Easy modernisation:** Straightforward conversion path to new FR series when upgrade is required

For over 50 years, office products manufacturer Durable has been producing display panels—framed pockets that serve as information media. At the end of the 1990s, the company automated assembly with a MELFA industrial robot from Mitsubishi Electric, which celebrates its 25th anniversary in production next year. This remarkable longevity demonstrates how far-sighted investment in robust automation technology can future-proof production equipment, conserve resources, and maintain cost-effective manufacturing for decades. When the time eventually comes for replacement, the successor FR series will seamlessly continue this success story.

The Challenge: Automating Durable's display panel production presented significant technical challenges. The complete feeding and handling process had to be accommodated within a compact production cell, leaving minimal space for robotic equipment. The robot needed to be compact and manoeuvrable enough to perform all necessary movements within these tight constraints. Additionally, the application imposed severe mechanical stress on the robot despite handling parts weighing just a few grams. Short cycle times, high dynamics, and large lever forces created substantial loads on the gearbox and brakes due to the robot's own mass during constant reversing movements, requiring careful maintenance planning to prevent breakdowns.

The Solution: Mitsubishi Electric's MELFA articulated robot proved compact and manoeuvrable enough to fit within the limited production cell whilst performing all required movements. The six-axis kinematics provided the speed and range needed for the demanding application with constant reversing operations. The robust technology was designed to withstand the mechanical stresses of continuous high-dynamic operation. To ensure ongoing reliability, Durable implemented a comprehensive maintenance programme using the robot's operating data for condition-based maintenance, supported by a complete spare parts inventory to maximise availability and prevent unplanned downtime.

The Results: The robot application has been a complete success, enabling Durable to produce display panels cost-effectively for 25 years. The robust Mitsubishi Electric technology has proven exceptionally long-lasting, more than proving itself in continuous operation despite the demanding application. The longevity of the installation exemplifies how quality-conscious, far-sighted investment in automation can future-proof production equipment and conserve resources. Thanks to this automation, Durable maintains competitive manufacturing capability decades after the initial investment. When modernisation eventually occurs, conversion to the new FR series will be straightforward—one cell has already been successfully upgraded, with users reporting the change is simple except for the programming environment.



Technical demands: Durable's display panel assembly requires precise, high-speed handling within an extremely compact production cell. The MELFA articulated robot's six-axis kinematics provides the flexibility to perform complex movements in confined spaces. Despite handling lightweight components of just a few grams, the application creates severe mechanical stress through constant reversing at high speeds with short cycle times. The robot's own mass generates substantial loads on gearboxes and brakes due to large lever forces during rapid direction changes, making this a demanding endurance test for any automation equipment.

Robust performance: The Mitsubishi Electric MELFA robot has successfully met these demanding requirements for a quarter century. The robust mechanical design and quality components have withstood continuous high-dynamic operation without requiring replacement. Durable supports this longevity through a disciplined maintenance programme that uses the robot's operating data for condition-based servicing, allowing predictive intervention before failures occur. A comprehensive spare parts inventory ensures rapid response to any maintenance needs, maximising uptime. This combination of inherently reliable technology and proactive maintenance has delivered exceptional availability throughout the robot's operational life.

Future-Ready transition: Despite the veteran robot's continued reliable operation, Durable is prepared for eventual modernisation to the FR series of MELFA industrial robots. This new generation offers internal cable routing, improved technical specifications, and enhanced optimisation possibilities whilst maintaining compatibility with existing applications. Durable has already successfully converted one production cell to the current FR series, with users reporting straightforward transition except for the updated programming environment. User-friendly teaching boxes simplify commissioning, whilst modern operating instructions provided through videos and online tutorials accelerate the learning process for the engineering team.

MITSUBISHI ELECTRIC CORPORATION
HEAD OFFICE: TOKYO BLDG., 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN

L(NA) XXXXXE-B XXXX(MDOC) Printed November 2022
All trademarks acknowledged